

ABSTRACT OF THE INVENTION

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The present invention relates to sonar beamforming systems and methods, using a forward-looking sonar having transmit and receive transducer arrays with a beamforming device and at least one side-looking sonar having dynamically range-focused beams. The forward-looking sonar provides for obstacle avoidance and undersea survey. The systems include one-dimensional transmit and receive transducer arrays with beamforming electronics, a computing controller such as, for example, a personal computer host controller. The arrays and beamforming electronics can be packaged in a hermetically sealed housing unit and mounted in Unmanned Underwater Vehicles (UUV). The side-looking sonar system includes for example, 32-element, one-dimensional arrays that are mounted on either side of the UUVs. Further, a downward looking Bathymetric sonar may be mounted on the underside of the vehicle for high-resolution mapping.